E-COMMERCE (CSEN2151)

Module IV

Building An E-COMMERCE Presence

1. A Systematic Approach
2. Choosing Software
3. Choosing Hardware

Understand the questions you must ask and answer, and the steps you should take, in developing an e-commerce presence.

Questions you must ask and answer when developing an e-commerce presence include:

- What is your vision and how do you hope to accomplish it?
- What is your business and revenue model?
- Who and where is the target audience?
- What are the characteristics of the marketplace?
- Where is the content coming from?
- Conduct a SWOT analysis.
- Develop an e-commerce presence map.
- Develop a timeline.
- Develop a detailed budget.

WHAT'S THE IDEA? (THE VISIONING PROCESS)

GITAM VISION :GITAM will be an exceptional knowledge-driven institution advancing on a culture of honesty and compassion to make a difference to the world.

Before you can plan and actually build an e-commerce presence, we need to have a

vision of what you hope to accomplish and how you hope to accomplish it.

- The vision includes not just a statement of mission, but also identification of the target audience, characterization of the market space, a strategic analysis, a marketing matrix, and a development timeline.
- It starts with a dream of what's possible and concludes with a timeline and preliminary budget for development.
  - For Amazon, it's to become the largest marketplace on earth. For
  - Facebook, it's to make the world more open and connected.
  - For Google, it's to organize the world's information and make it universally accessible and useful.

"The e-commerce presence you want to build may not have such all-encompassing ambitions, but a succinct statement of mission, purpose, and direction is the key factor in driving the development of your project."

WHERE'S THE MONEY: BUSINESS AND REVENUE MODEL

- We will need to develop a preliminary idea of our business and revenue models.
- No need to have a detailed revenue and cost projections at this point. Instead, a general idea of how your business will generate revenues will work.
- Basic business models include **portal, e-tailer, content provider, transaction broker, market creator, service provider, and community provider (social network).**
- The basic revenue model alternatives are **advertising, subscriptions, transaction fees, sales, and affiliate revenue.**
- There's no reason to adopt a single business or revenue model, and in fact, many firms have multiple models.
- For instance, the *Financial Times* digital business model is to both sell subscriptions and sell ad space. In addition, they sell unique photographs and gifts.
- Amazon shopping site includes amazon prime, amazon groceries etc.

Category

‹ Health & Personal Care

Household Supplies

- Air Fresheners
- Dishwashing Supplies
- Household Cleaners
- Indoor Insect & Pest Control
- Laundry
- Papers, Wraps & Bags
- Pooja Supplies

Health Brands

- ☐ Made for Amazon
- ☐ Top Brands

Amazon Prime

- ☐ ✓prime

Subscription Option

- ☐ Subscribe & Save

UP TO 30% OFF | HOUSEHOLD SUPPLIES

Shop by category

Laundry Essentials

Household Cleaners

Dishwashing Supplies

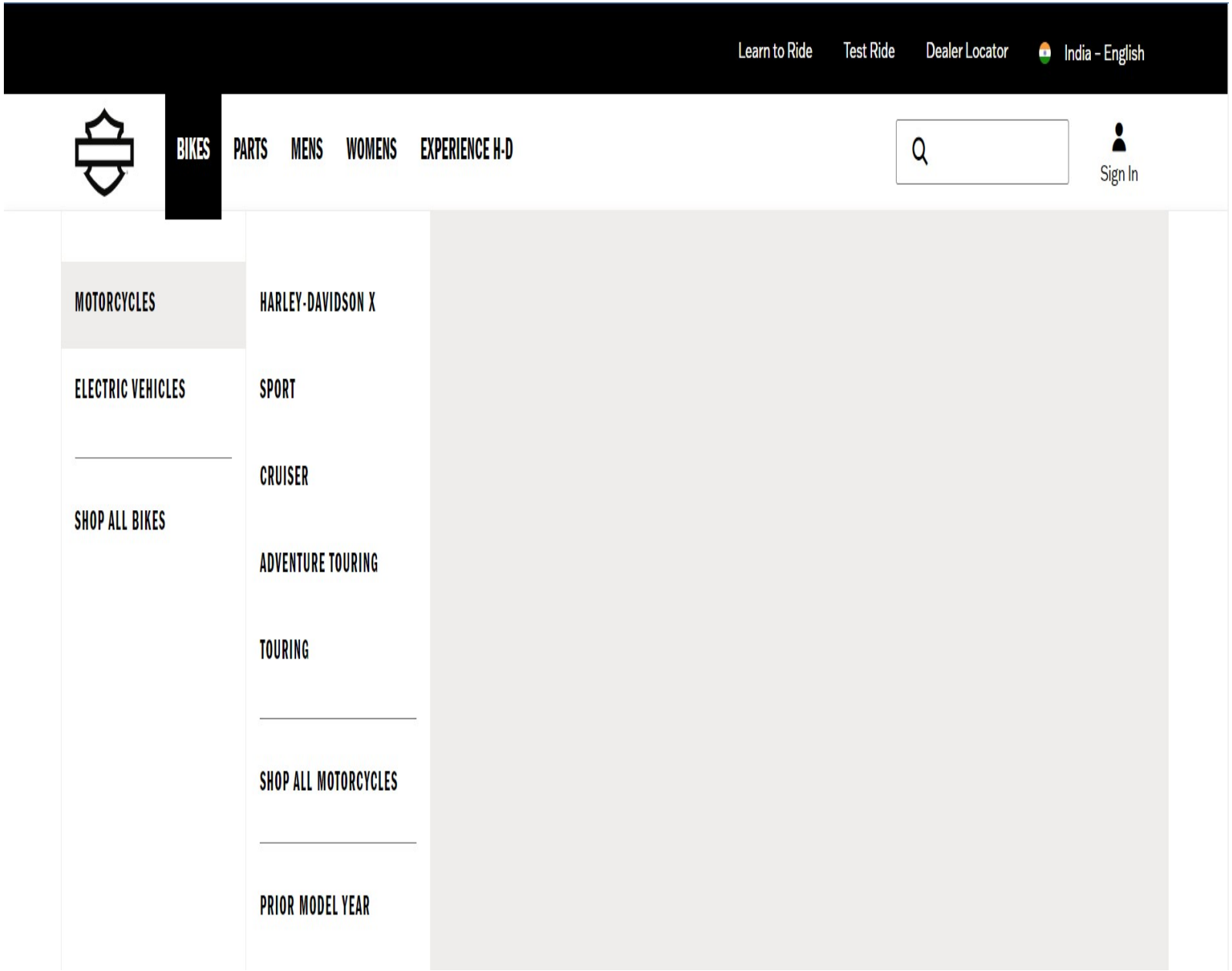
Air Fresheners

Starting ₹149 | Best of Laundry Care

WHO AND WHERE IS THE TARGET AUDIENCE?

- There are two questions here: who is your target audience and where can you best reach them?
- Your target audience can be described in a number of ways:
  - Demographics - includes age, income, gender, and location.
  - Behavior patterns (lifestyle),
  - Current consumption patterns (online vs. offline purchasing),
  - Digital usage patterns,
  - Content creation preferences (blogs, social networks, sites like Pinterest), and
  - Buyer personas (profiles of your typical customer).

- For instance Harley-Davidson sells motorcycles to a broad demographic range of varying ages, incomes, and locations, from 34-year-olds to 65-year-olds.


Learn to Ride
Test Ride
Dealer Locator
India - English
BIKES
PARTS
MENS
WOMENS
EXPERIENCE H-D
Sign In
MOTORCYCLES
ELECTRIC VEHICLES
SHOP ALL BIKES
HARLEY-DAVIDSON X
SPORT
CRUISER
ADVENTURE TOURING
TOURING
SHOP ALL MOTORCYCLES
PRIOR MODEL YEAR

WHAT IS THE BALLPARK? CHARACTERIZE THE MARKETPLACE

- The chances of your success will depend greatly on the characteristics of the market you are about to enter, and not just on your entrepreneurial brilliance.
- Enter a declining market filled with strong competitors, and you will multiply your chances of failure.
- Enter a market that is emerging, growing, and has few competitors, and you stand a better chance.
- Enter a market where there are no players, and you will either be rewarded handsomely with a profitable monopoly on a successful product no one else thought of (Apple) or you will be quickly forgotten because there isn't a market for your product at this point in time.
- Market size and growth: Is the market growing, receding, or stagnant? Which age and income groups are driving the growth?
- Delivery mode: Is the market shifting from offline to online delivery? If so, is it moving toward traditional websites or the mobile platform?
- Social media presence: What percentage of the target audience uses social media, and which platforms are most popular? Are potential customers talking about products like yours on social media?

- Competition: Who are the top competitors, and what are their market share and distinguishing characteristics?
  - What's the market buzz on your competitors?
  - How many unique monthly visitors (UMVs) do they have?
  - How many Facebook or Instagram Likes, Twitter followers, and/or Pinterest followers?
  - How are your competitors using social networks and mobile devices as a part of their online presence.
  - Is there something special you could do with social networks that your competitors do not?
  - Do a search on customer reviews of their products.
    - We can find online services (some of them free) that will measure the number of online conversations about our competitors, and the total share of Internet voice each of your competitors receives

The structure of the market is described in terms of your direct competitors,

suppliers, and substitute products.

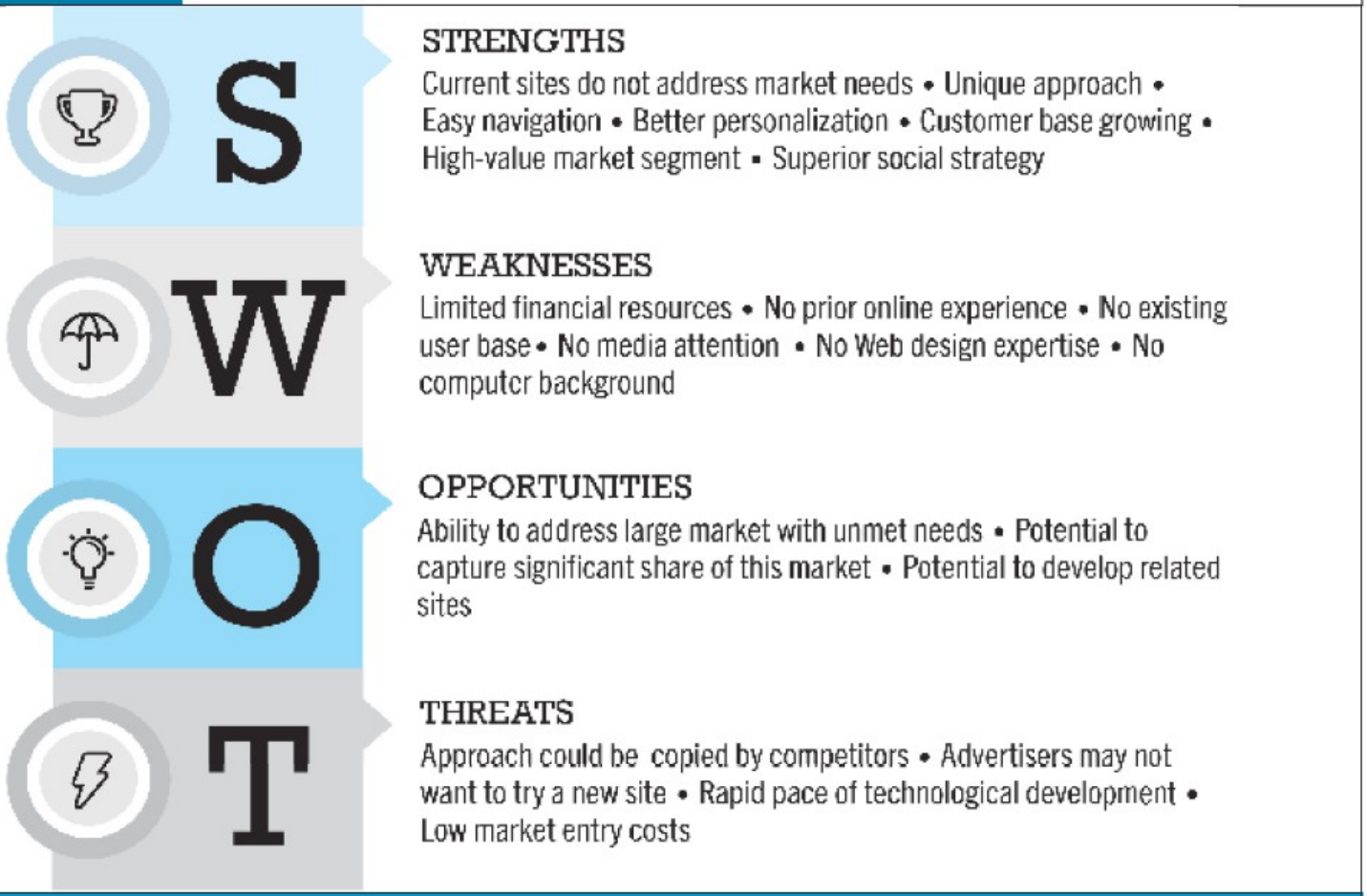
- Direct competitors are businesses that offer the same or similar products or services to the same target market. For example, direct competitors of Apple include Samsung, Google, and Huawei.
- Suppliers are businesses that provide the raw materials or components that your business needs to produce its products or services. For example, suppliers to Apple include Foxconn, TSMC, and Sony.
- Substitute products are products or services that can meet the same needs as your products or services. For example, substitute products for Apple's iPhone include Android smartphones and feature phones.

WHERE'S THE CONTENT COMING FROM?

- This content is what search engines catalog as they crawl through all the new and changed web pages on the Internet.
- The content is why your customers visit your site and either purchase things or look at ads that generate revenue for you.
- Therefore, the content is the single most important foundation for your revenue and ultimate success.
- There are generally two kinds of content:
  - **Static content**: This is content that does not change frequently, such as product descriptions, photos, or text that you create to share with your visitors.
  - **Dynamic content**: This is content that changes regularly, such as user-generated content, news articles, or social media posts.
    - **User-generated content**: This is content that is created by your users, such as product reviews, blog posts, or photos. It can be a great way to engage your audience and keep your website fresh.
- **External content**: This is content that is created by other websites and embedded on your own website. For example, you could embed a YouTube video or a Pinterest image on your website.
- .

KNOW YOURSELF: CONDUCT A SWOT ANALYSIS

FIGURE 4.1 SWOT ANALYSIS

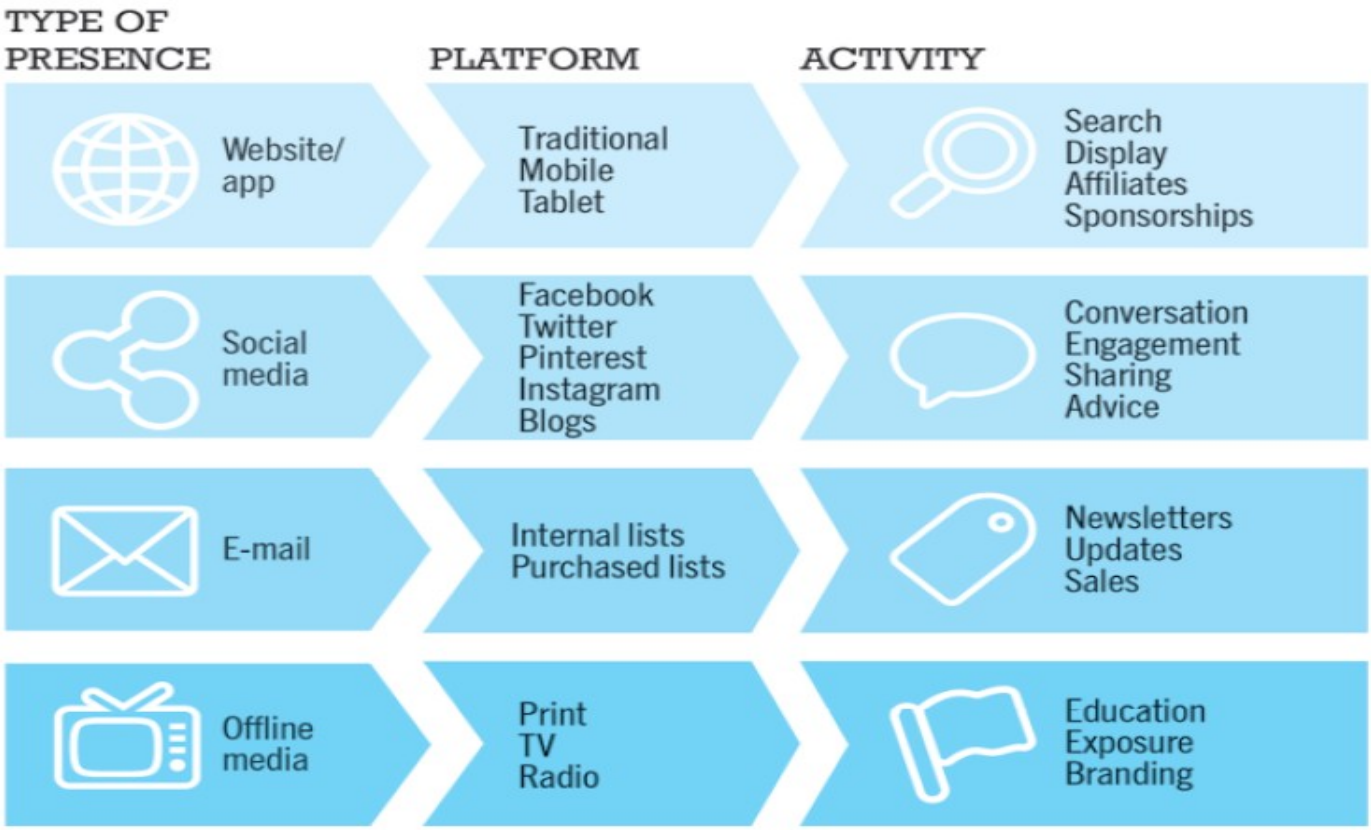

S
STRENGTHS
Current sites do not address market needs • Unique approach • Easy navigation • Better personalization • Customer base growing • High-value market segment • Superior social strategy
W
WEAKNESSES
Limited financial resources • No prior online experience • No existing user base • No media attention • No Web design expertise • No computer background
O
OPPORTUNITIES
Ability to address large market with unmet needs • Potential to capture significant share of this market • Potential to develop related sites
T
THREATS
Approach could be copied by competitors • Advertisers may not want to try a new site • Rapid pace of technological development • Low market entry costs

Here are some examples of how you can use the results of your SWOT analysis:

- Strengths: Use your strengths to differentiate yourself from your competitors and to attract new customers.
- Weaknesses: Develop plans to improve your weaknesses. For example, if you have a weakness in marketing, you could hire a marketing consultant or take some marketing courses.
- Opportunities: Develop strategies to take advantage of opportunities. For example, if you see an opportunity in a new market, you could develop a product or service for that market.
- Threats: Develop plans to mitigate threats. For example, if you have a threat from a new competitor, you could develop a plan to compete with them.

DEVELOP AN E-COMMERCE PRESENCE MAP

FIGURE 4.2 **E-COMMERCE PRESENCE MAP**



An e-commerce presence requires firms to consider the four different kinds of presence, and the platforms and activities associated with each type of presence.

- Website/app: This is your online storefront. You need to have a website or app that is optimized for all devices, including desktop computers, tablets, and smartphones.
- Social media: Social media platforms like Facebook, Twitter, and Instagram are a great way to connect with potential customers. You can use social media to promote your products, share news and updates, and offer customer support.
- Email: Email marketing is a great way to stay in touch with potential and existing customers. You can use email to send out newsletters, promotional offers, and other relevant information.
- Offline media: Offline media, such as print ads, television commercials, and radio ads, can be used to drive traffic to your website or app.

For each type of e-commerce presence, there are different platforms and related activities you need to consider. For example, in the case of websites and apps, you need to think about search engine marketing, display ads, affiliate programs, and sponsorships. In the case of social media, you need to think about content marketing, social media advertising, and community management.

DEVELOP A TIMELINE: MILESTONES

- Where would you like to be a year from now?
- It's a good idea for you to have a rough idea of the time frame for developing your e-commerce presence when you begin.
- You should break your project down into a small number of phases that could be completed within a specified time.
- Six phases are usually enough detail at this point. **Table 4.1** illustrates a one-year timeline for the development of a startup e-commerce company.

TABLE 4.1 E-COMMERCE PRESENCE TIMELINE

PHASE	ACTIVITY	MILESTONE
Phase 1: Planning	Envision e-commerce presence; determine personnel	Mission statement
Phase 2: Website development	Acquire content; develop a site design; arrange for hosting the site	Website plan
Phase 3: Web implementation	Develop keywords and metatags; focus on search engine optimization; identify potential sponsors	A functional website
Phase 4: Social media plan	Identify appropriate social platforms and content for your products and services	A social media plan
Phase 5: Social media implementation	Develop Facebook, Instagram, Twitter, and Pinterest presence	Functioning social media presence
Phase 6: Mobile plan	Develop a mobile plan; consider options for porting your website to mobile devices	A mobile plan

HOW MUCH WILL THIS COST?

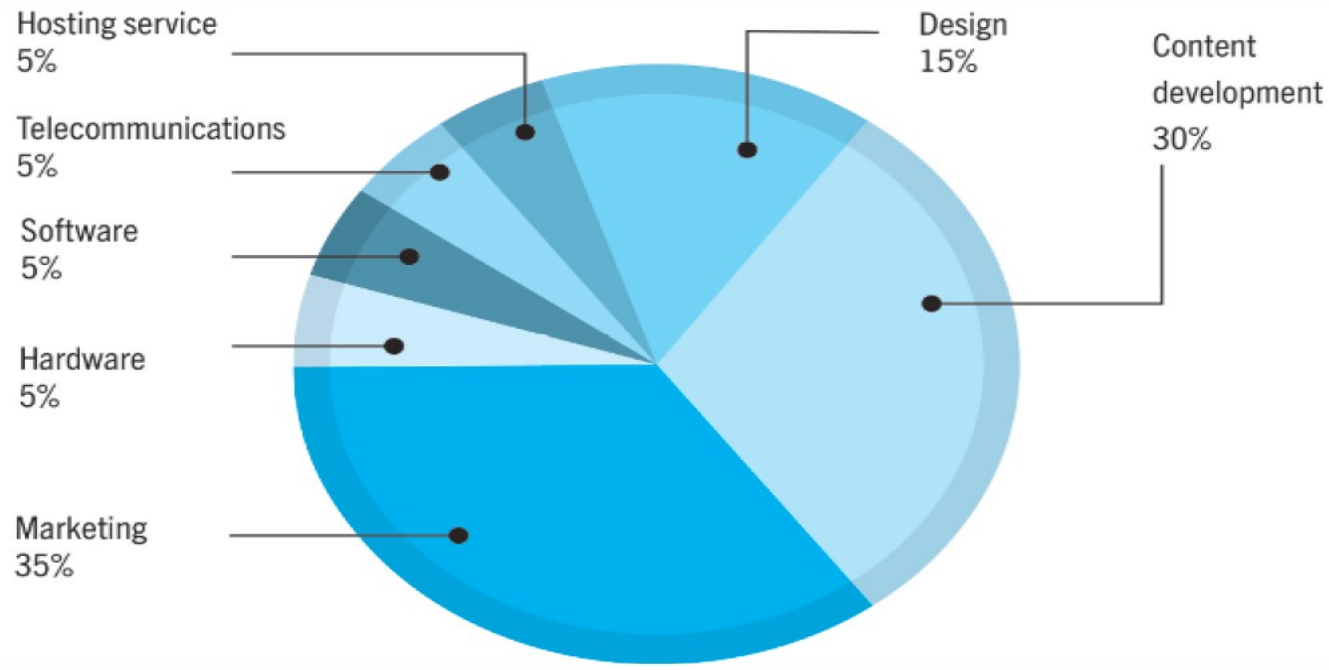
- While how much you spend to build a website depends on how much you can afford,

  and, of course, the size of the opportunity, **Figure 4.3** provides some idea of the relative

  size of various website costs.

- The longer-term costs would also have to include site and system ma
de

FIGURE 4.3 COMPONENTS OF A WEBSITE BUDGET



While hardware and software costs have fallen dramatically, websites face significant design, content development, and marketing costs.

- **BUILDING AN E-COMMERCE PRESENCE: A SYSTEMATIC APPROACH**

- Building a successful e-commerce presence requires a keen understanding of business, technology, and social issues, as well as a systematic approach.
- The two most important management challenges are

  (1) developing a clear understanding of your business objectives and

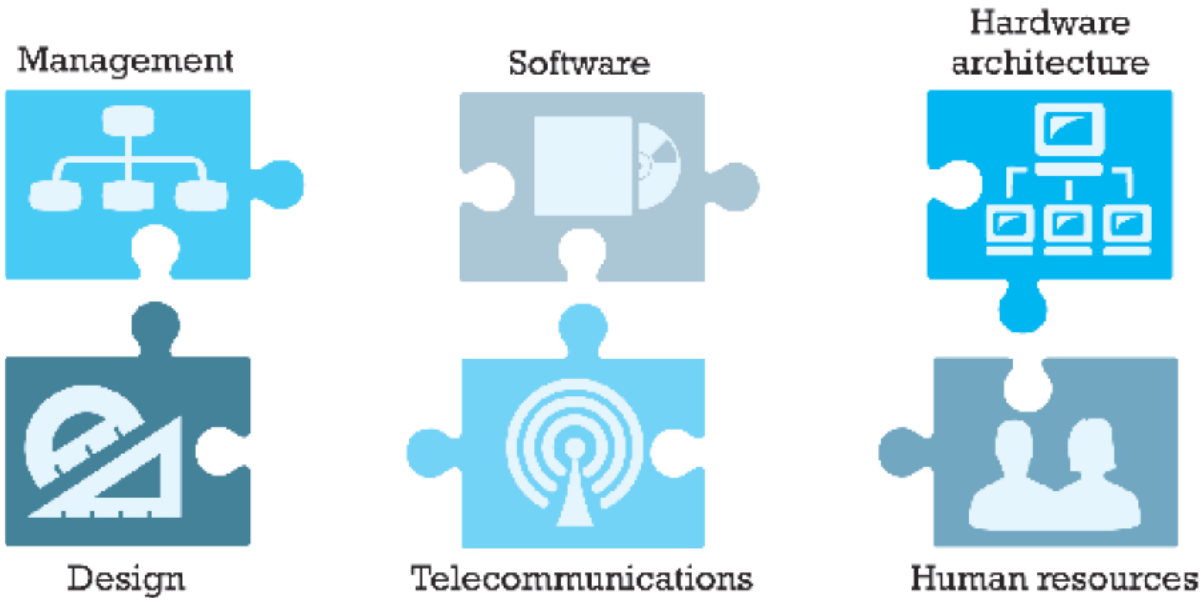
  (2) knowing how to choose the right technology to achieve those objectives.

- The first challenge requires you to build a plan for developing your firm's presence.
- The second challenge requires you to understand some of the basic elements of e-commerce infrastructure.

- First, we must be aware of the main areas where you will need to make decisions

  (see **Figure 4.4**).

FIGURE 4.4 **FACTORS TO CONSIDER IN DEVELOPING AN E-COMMERCE PRESENCE**



Building an e-commerce presence requires that you systematically consider the many factors that go into the process.

- Once we have identified the key decision areas, you will need to think about a plan for developing the project. There are a number of different methodologies for building information systems such as websites.
- One of the most traditional methods is the systems development life cycle, described in the following section.
- The **systems development life cycle (SDLC)** is a methodology for understanding the

  business objectives of any system and designing an appropriate solution.
- The SDLC method also helps in creating documents that communicate objectives,

  important milestones, and the uses of resources to management.
- There are five major steps involved in the systems development life cycle:
  - Systems analysis/planning
  - Systems design
  - Building the system
  - Testing
  - Implementation and maintenance

- Systems Analysis/Planning:

Identify Business Objectives, System Functionality, and Information Requirements

- One way to start is to identify the specific business objectives for your site, and then

  develop a list of system functionalities and information requirements.
- **Business objectives** are simply capabilities you want your site to have.
- **System functionalities** are types of information systems capabilities you will need
- to achieve your business objectives.
- The **information requirements** for a system are the information elements that the system must produce in order to achieve the business objectives.
- You will need to provide these lists to system developers and programmers so they know what you as the manager expect them to do.
- In the below able, there are ten basic business objectives that an e-commerce site must deliver.
- These objectives must be translated into a description of system functionalities and ultimately into a set of precise information requirements.

TABLE 4.2 SYSTEM ANALYSIS: BUSINESS OBJECTIVES, SYSTEM FUNCTIONALITIES, AND INFORMATION REQUIREMENTS FOR A TYPICAL E-COMMERCE SITE

BUSINESS OBJECTIVE	SYSTEM FUNCTIONALITY	INFORMATION REQUIREMENTS
Display goods	Digital catalog	Dynamic text and graphics catalog
Provide product information (content)	Product database	Product description, stocking numbers, inventory levels
Personalize/customize product	Customer on-site tracking	Site log for every customer visit; data mining capability to identify common customer paths and appropriate responses
Engage customers in conversations	On-site blog; user forums	Software with blogging and community forum functionality
Execute a transaction	Shopping cart/payment system	Secure credit card clearing; multiple payment options
Accumulate customer information	Customer database	Name, address, phone, and e-mail for all customers; online customer registration
Provide after-sale customer support	Sales database	Customer ID, product, date, payment, shipment date
Coordinate marketing/ advertising	Ad server, e-mail server, e-mail, campaign manager, ad banner manager	Site behavior log of prospects and customers linked to e-mail and banner ad campaigns
Understand marketing effectiveness	Site tracking and reporting system	Number of unique visitors, pages visited, products purchased, identified by marketing campaign
Provide production and supplier links	Inventory management system	Product and inventory levels, supplier ID and contact, order quantity data by product

- Once you have identified the business objectives and system functionalities, and have developed a list of precise information requirements, you can begin to consider just how all this functionality will be delivered.

System Design: Hardware and Software Platforms

- Idea is to come up with a **system design specification**

  "A description of the main components in the system and their relationship to one another."

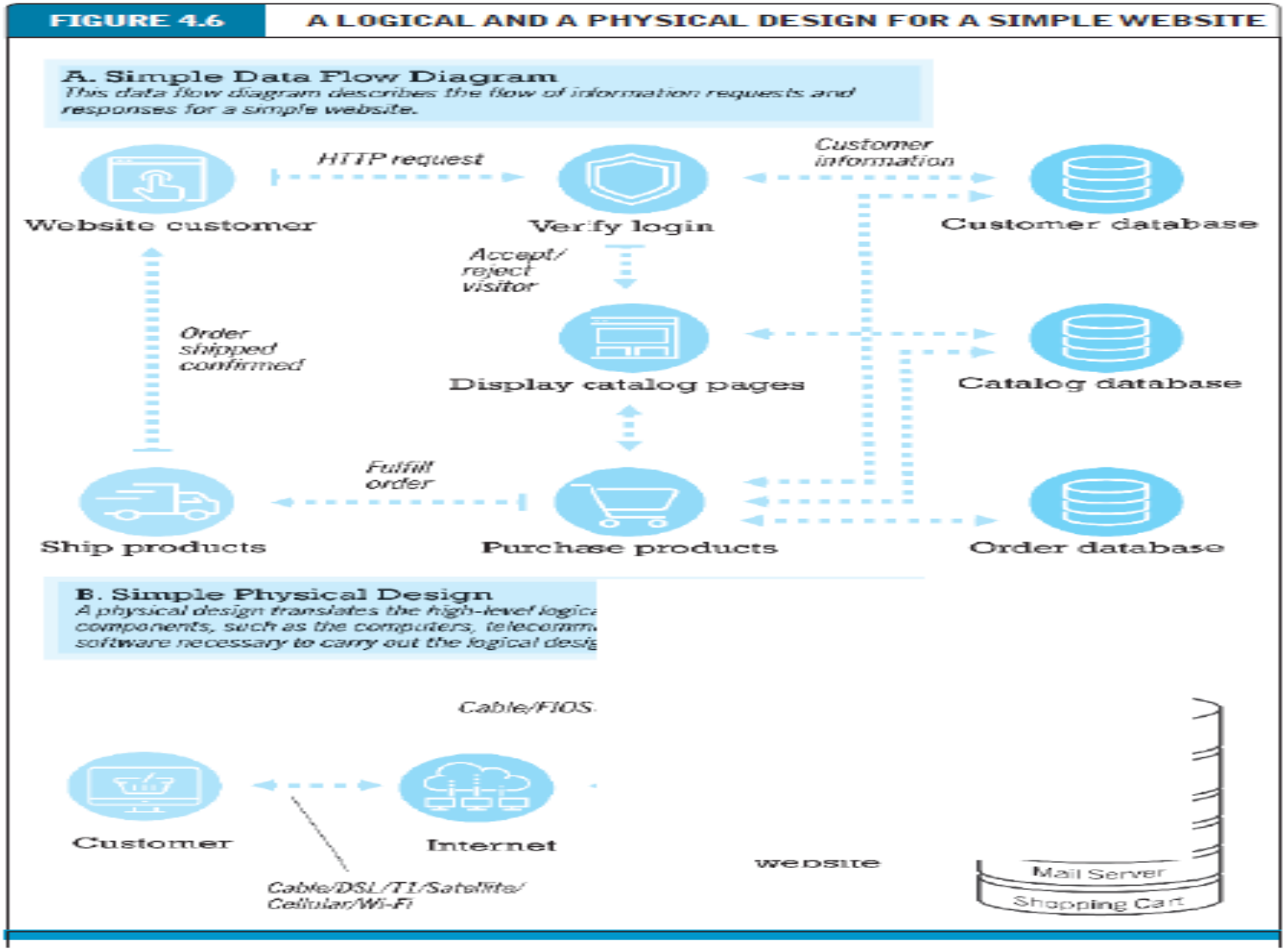
- Further the system design itself can be broken down into two components: a logical design and a physical design.

- A **logical design** includes a data flow diagram that describes the flow of information at your e-commerce site, the processing functions that must be performed, and the databases that will be used.
- The logical design also includes a description of the security and emergency backup procedures that will be instituted, and the controls that will be used in the system.

- A **physical design** translates the logical design into physical components. For instance, the physical design details the specific model of server to be purchased, the software to be used, the size of the telecommunications link that will be required, the way the system will be backed up and protected from outsiders, and so on.

- **Figure 4.6(a)** presents a data flow diagram for a simple high-level logical design for

  a very basic e-commerce website, while **Figure 4.6(b)** shows the corresponding physical



Next comes a question on how to actually build the site.

Building the System:

- In this stage we have many choices, and much depends on the amount of money you are willing to spend.
- Choices range from outsourcing everything (including the actual systems analysis and design) to building everything yourself (in-house).

In-house Versus Outsourcing:

- **Outsourcing** means that we will hire an outside vendor to provide the services involved in building the site.
- **Plan : Will you host (operate) the site on your firm's own servers or will you outsource the hosting to a web host provider?**
- There are some vendors who will design, build, and host your site, while others will either build or host (but not both).

Build Your Own versus Outsourcing:

- Unless we are fairly skilled, we should use a pre-built template to create the website.

- One of the least expensive and most widely used site building tools is WordPress.
  1. WordPress is a widely used and cost-effective website building tool.
  2. It offers a sophisticated Content Management System (CMS) for managing website content.
  3. A content management system (CMS) is a database software program

     specifically designed to manage structured and unstructured data and objects

     in a website environment. A CMS provides web managers and designers with a

     centralized control structure to manage website content.
- Features of WordPress include
  1. WordPress provides a plethora of widgets and plugins for extending website functionality.
  2. Plugins like WooCommerce enable e-commerce capabilities.
  3. Websites built with WordPress are indexed by search engines and can generate revenue through ads, affiliates, and sponsors.

- Alternatives to WordPress:
  1. Other user-friendly website building tools include GoDaddy, Weebly, Wix, Squarespace, and Shopify.
  2. These tools have limitations in terms of customization.
- Customization Options:
  1. For more extensive customization, you can build a website from scratch using HTML, CSS, and programming tools.
  2. Software like Adobe Dreamweaver CC and Microsoft Visual Studio enables quick web page creation.

1. Enterprise-Level Solutions:

   Large companies can opt for advanced prepackaged site-building tools like Sitecore Commerce or HCL Commerce for highly customized e-commerce solutions.

   Risks of DIY(do-it-yourself) Website Building:

   1. Building a website from scratch involves high costs and complex features like shopping carts and credit card processing.
   2. DIY efforts may not meet professional standards.

- **Benefits of DIY Website Building:**
  1. Building a site from scratch allows precise customization and in-house control.
  2. It provides flexibility to adapt to changing business needs.
- Purchasing Prepackaged Solutions:
  1. Buying more expensive site-building packages can expedite market entry.
  2. Evaluating different packages and potential modifications is necessary, which can raise costs.
-

Testing the System:

- **System Testing Overview:**
  - Testing is an essential phase in the development of a system.
  - Testing is required for both outsourced and in-house systems.
  - Complex e-commerce sites can have thousands of pathways that need to be documented and tested.
  - Testing is often under-budgeted, with up to 50% of the budget allocated for testing and rebuilding, depending on the initial design quality.

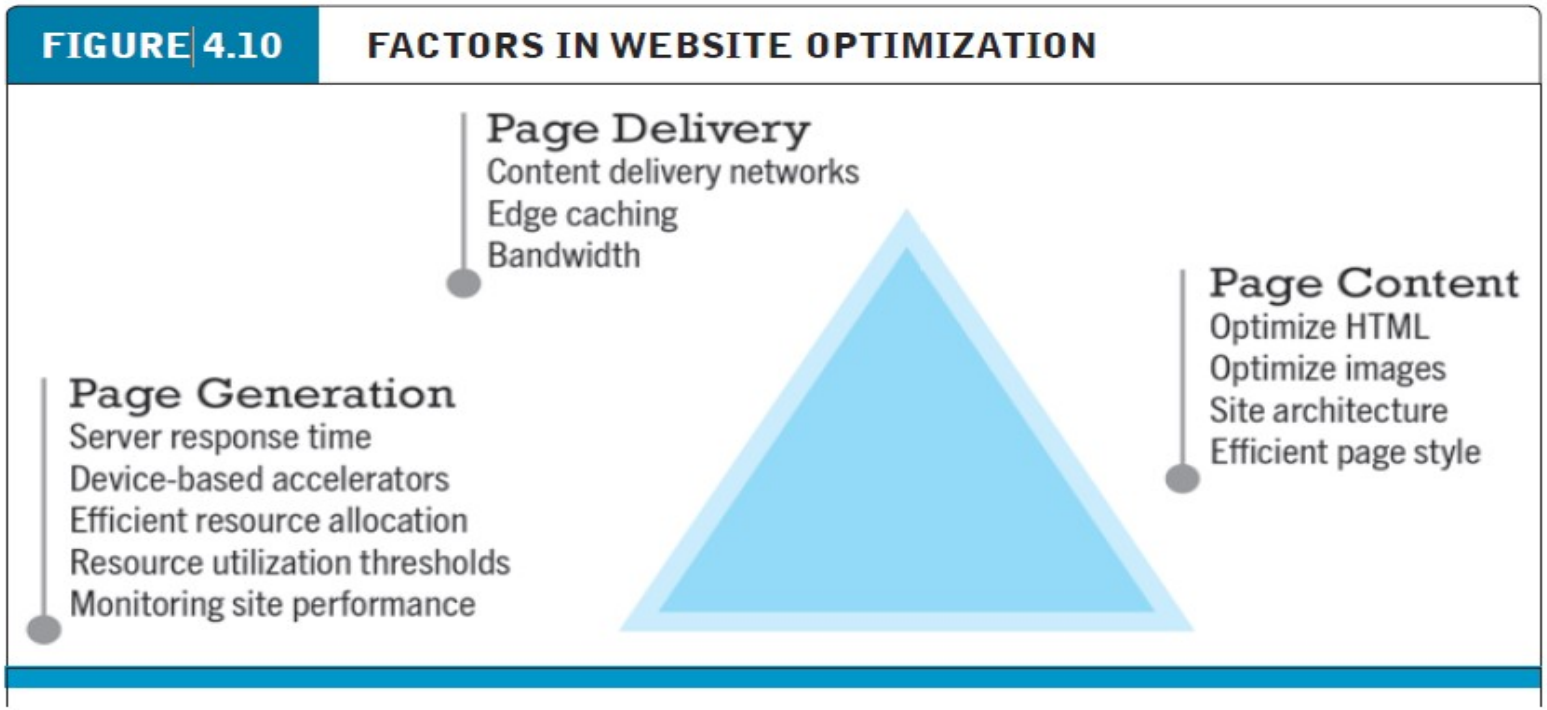
A=2 b=2 c=a+b

- **Types of Testing:**
  - Unit testing involves testing individual program modules one at a time.
  - System testing assesses the entire site, simulating how a typical user interacts with it.
  - Final acceptance testing involves key personnel and managers using the system to verify that it meets the original business objectives.

- **A/B Testing:**
  - A/B testing, or split testing, is a method to compare two versions (A and B) of a web page or website to determine which performs better.
  - Different types of A/B testing include template tests, new concept tests, funnel tests, and multivariate testing.
  - Template tests compare different layouts or design treatments for the same page content.
  - New concept tests compare a control page with a very different version.
  - Funnel tests analyze the flow through a series of pages to improve conversion rates.
  - Multivariate testing involves testing specific elements or variables on a web page, creating various versions for each element, and testing different combinations to optimize layout, color, content, and format.

- **Efficient Page Design and Content:**
  - Efficient styles and techniques in **page design and content** can significantly reduce website response times by two to five seconds.
  - Steps for optimization include minimizing unnecessary HTML comments and white space, using more efficient graphics, and avoiding unnecessary links to other pages on the site.
- **Server Segregation and Specialized Devices:**
  - **Page generation** speed can be improved by segregating computer servers to perform dedicated functions, such as static page generation, application logic, media servers, and database servers.
  - Various devices from vendors can be used to speed up these servers, enhancing overall website performance.
  - Using a single server or multiple servers to perform multiple tasks can have a significant impact on website throughput.
  - Using multiple servers for dedicated functions is more efficient and can help avoid performance bottlenecks.

- **Content Delivery Networks (CDNs) and Bandwidth:**
  - **Page delivery** can be accelerated by leveraging specialized content delivery networks (CDNs) like Akamai.
  - Increasing local bandwidth can also contribute to



Website optimization requires that you consider three factors: page content, page generation, and page delivery.

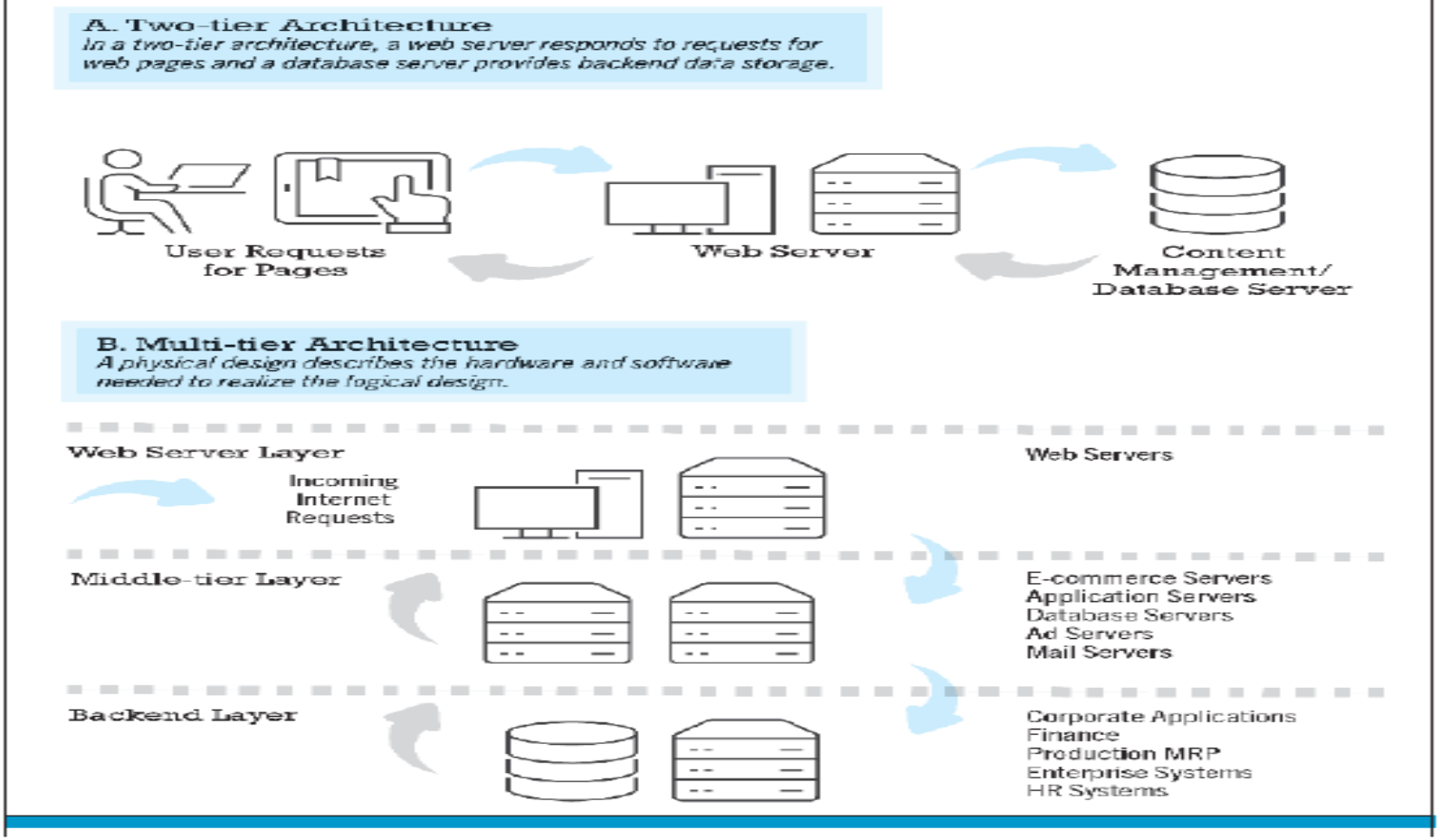
CHOOSING SOFTWARE

SIMPLE VERSUS MULTI-TIERED WEBSITE ARCHITECTURE

- **Website Architecture Evolution:**
  - In the early days, websites were simple, delivering web pages to users upon request.
  - These websites had single-tier system architecture, consisting of a server computer running basic web server software.
- **E-commerce's Demands:**
  - E-commerce required more interactive functionality, including responding to user input, processing orders, handling credit card transactions, accessing databases, and personalizing content.
  - This led to the development of web application servers and a multi-tiered system architecture to manage the increased processing requirements.
- **Web Application Servers:**
  - Web application servers are specialized software programs designed for various transaction processing tasks required by e-commerce.

- **Integration with Backend Databases:**
  - E-commerce sites need to interact with pre-existing corporate databases, often referred to as backend or legacy databases.
  - These legacy databases contain valuable information on customers, products, employees, and vendors.
- **Two-Tier vs. Multi-Tier Architecture:**
  - In a two-tier architecture, a web server responds to web page requests, and a separate database server handles backend data storage.
  - In a multi-tier architecture, a middle-tier layer, including application servers, comes between the web server and backend databases. It employs multiple physical computers to share the processing workload.
- **Web Server Software and Application Servers:**
  - The remaining section discusses the functionality of web server software and the various types of web application servers.

FIGURE 4.11 **TWO-TIER AND MULTI-TIER E-COMMERCE SITE ARCHITECTURES**



There are also many other smaller providers or open source versions of web server software. Note that the choice of web server has little effect on users of your system. The pages they see will look the same regardless of the development environment. There are many advantages to the Microsoft suite of development tools—they are integrated, powerful, and easy to use. The Unix operating system, on the other hand, is exceptionally reliable and stable, and there is a worldwide open software community that develops and tests Unix-based web server software.

WEB SERVER SOFTWARE:

- **Web Server Software Selection:**
  - All e-commerce sites require web server software to respond to customer requests for HTML and XML pages.
  - The choice of web server software also involves selecting an operating system for the site's computers.
- **Leading Web Server Software - Apache:**
  - Apache is a leading web server software known for its widespread use with Linux and Unix operating systems.
  - It is prominent in terms of domains, active sites, and usage by the busiest sites.
  - Apache is free, stable, and has a strong development community.
- **Operating Systems:**
  - Unix, the original programming language of the Internet and Web, and Linux, a derivative designed for personal computers, are commonly used with Apache.
  - Using Apache requires staff knowledgeable in Unix or Linux.

- **Microsoft Internet Information Services (IIS):**
  - IIS is another popular web server software based on the Windows operating system.
  - It is compatible with Microsoft utility and support programs.
  - Various smaller providers and open-source versions of web server software are available.
- **User Experience Consistency:**
  - The choice of web server software has little effect on the appearance of pages for users. The user experience remains consistent.
- **Advantages of Development Tools:**
  - Microsoft's suite of development tools is integrated, powerful, and user-friendly.
  - Unix-based operating systems are known for their reliability and stability, with a global open software community that develops and tests web server software.

TABLE 4.4 BASIC FUNCTIONALITY PROVIDED BY WEB SERVERS

FUNCTIONALITY	DESCRIPTION
Processing of HTTP requests	Receive and respond to client requests for HTML pages
Security services (Secure Sockets Layer)/ Transport Layer Security	Verify username and password; process certificates and private/public key information required for credit card processing and other secure information
File Transfer Protocol	Permits transfer of very large files from server to server
Search engine	Indexing of site content; keyword search capability
Data capture	Log file of all visits, time, duration, and referral source
E-mail	Ability to send, receive, and store e-mail messages
Site management tools	Calculate and display key site statistics, such as unique visitors, page requests, and origin of requests; check links on pages

- **Site Management Tools:**
- Site management tools are essential for ensuring your website functions correctly and for monitoring its performance.
- They check and verify links, identify orphan files, and report potential problems, such as dead links.
- Site management tools help prevent user frustration due to broken links or error messages.
- They can also provide insights into consumer behavior, monitor purchases, and assess marketing campaign effectiveness.
- **Dynamic Page Generation Tools:**
- E-commerce websites require dynamic content due to ever-changing product listings, prices, and customer interactions.
- Dynamic HTML (DHTML) uses technologies like HTML, CSS, JavaScript, and the Document Object Model (DOM) to create interactive websites.
- Dynamic page generation stores web page content as database objects, fetched upon user requests.
- Java Server Pages (JSP), Node.js, ASP.NET, and other server-side programs fetch these objects from the database.
- Dynamic page generation is more efficient than hard-coding content in HTML pages.

APPLICATION SERVERS

E-commerce Merchant Server Software:

- E-commerce merchant server software provides core functionality for online sales, including online catalogs, shopping carts, and credit card processing.
- The online catalog showcases a company's products and may vary in complexity from simple lists to multimedia-rich catalogs.
- Shopping carts enable customers to select, review, and purchase

TABLE 4.5 APPLICATION SERVERS AND THEIR FUNCTION

APPLICATION SERVER	FUNCTIONALITY
Catalog display	Provides a database for product descriptions and prices
Transaction processing (shopping cart)	Accepts orders and clears payments
List server	Creates and serves mailing lists and manages e-mail marketing campaigns
Proxy server	Monitors and controls access to main web server; implements firewall protection
Mail server	Manages Internet e-mail
Audio/video server	Stores and delivers streaming media content
Chat server	Creates an environment for online real-time text and audio interactions with customers
News server	Provides connectivity and displays Internet news feeds
Fax server	Provides fax reception and transmission using a web server
Groupware server	Creates workgroup environments for online collaboration
Database server	Stores customer, product, and price information
Ad server	Maintains web-enabled database of advertising banners that permits customized and personalized display of advertisements based on consumer behavior and characteristics
Auction server	Provides a transaction environment for conducting online auctions
B2B server	Implements buy, sell, and link marketplaces for commercial transactions

- MERCHANT SERVER SOFTWARE PACKAGES (E-COMMERCE SOFTWARE PLATFORMS)
- Merchant server software packages (e-commerce software platforms) offer integrated environments for e-commerce development.
- They come in different price ranges and offer varying levels of functionality.
- Small firms may opt for e-commerce templates provided by services like Shopify, while larger companies may prefer integrated software platforms.
- Open source merchant server software allows for custom-built websites but requires significant programming time and expertise.

TABLE 4.6 OPEN SOURCE SOFTWARE OPTIONS

FUNCTIONALITY	OPEN SOURCE SOFTWARE
Web server	Apache (the leading web server for small and medium businesses)
Shopping cart, online catalog	Many providers: osCommerce, Zen Cart, AgoraCart, X-cart, AspDotNetStorefront
Credit card processing	Credit card acceptance is typically provided in shopping cart software but you may need a merchant account from a bank as well.
Database	MySQL (the leading open source SQL database for businesses)
Programming/scripting language	PHP is a scripting language embedded in HTML documents but executed by the server, providing server-side execution with the simplicity of HTML editing. JavaScript programs are typically client-side programs that provide user interface components. Ruby on Rails (RoR, Rails) and Django are popular open source web application frameworks. Python and Perl are two other open source programming languages used in web development.
Analytics	Analytics keep track of your site's customer activities and the success of your web advertising campaign. You can also use Google Analytics if you advertise on Google, which provides good tracking tools; most hosting services will provide these services as well. Other open source analytic tools include Matomo and Open Web Analytics.

- **Choosing an E-commerce Software Platform:**
- Selecting the right e-commerce software platform is a crucial decision for building an e-commerce site.
- Consider factors like functionality, support for different business models, business process modeling, visual site management tools, performance, scalability, and connectivity to existing systems.
- Compliance with standards, global and multicultural capabilities, and local tax and shipping rules are essential factors.
- The platform should accommodate both global and local operations, supporting multiple languages, currencies, and tax systems.

CHOOSING HARDWARE

- **Demand Side: Factors Affecting Website Demand**

1. Demand on a website is influenced by several factors, including the type of site, number of simultaneous users, customer requests, content type, security requirements, inventory size, page requests, and legacy application speed.
2. The number of simultaneous users in peak periods is a significant factor. Web sessions initiated by users are typically stateless and short-lived.
3. Degradation in system performance occurs as more simultaneous users request service. It's important to ensure graceful degradation until a peak load is reached.
4. Website performance is often constrained by the server's I/O limitations and telecommunications connections rather than processor speed.
5. User profiles, the nature of customer requests (e.g., searches, forms, and shopping cart usage), and content type can significantly impact demand on the website.

- **Supply Side: Scaling Your Hardware Platform**

1. Scalability is the ability of a site to grow as demand increases, and it's a crucial consideration for hosting your website.
2. There are three primary ways to scale your hardware platform: vertical scaling, horizontal scaling, and improving the processing architecture.
3. Vertical scaling involves upgrading individual servers by adding more processors and increasing chip speeds. However, it can become costly and create a single point of failure.
4. Horizontal scaling entails adding multiple single-processor servers and distributing the workload. Load-balancing software is used to direct incoming requests to different servers. It is cost-effective and introduces redundancy.

5. Improving the processing architecture combines vertical and horizontal scaling with design decisions to optimize performance. This includes separating I/O-intensive and CPU-intensive tasks and fine-tuning servers for each type of load.
6. Steps to improve processing architecture may involve adding RAM to store HTML pages, moving CPU-intensive activities to dedicated high-end servers, and reducing the number of servers required for the same workload.
7. These considerations are essential for ensuring that your e-commerce website can handle peak demand without overloading, resulting in a smooth and efficient user experience. Properly right-sizing your hardware platform is key to achieving this balance.